REMARKS

Applicants express their disappointment in the present action to reject claims that had been previously allowed, based upon art that had been previously considered.

Claims 8 and 24 have been amended to the filler metal contains at least about 0.05% carbon, in accordance with Applicants' preferred range, see page 9, Table 1.

Claim Rejection based upon Japanese Patent Documents

Claims 8-10 and 12-25 were rejected under 35 U.S.C. § 103 as unpatentable over Japanese patent document 358174554 (JP '554) or Japanese patent document 356105456 (JP '456) or Japanese patent document 2000094182 (JP '182).

While Applicants' filler metal may be used in other applications, it is particularly suited for welding SAE 409 stainless steel and SAE 1008 mild steel, see paragraph 0024. For this purpose, the composition of the filler metal is controlled to form a weld having improved properties. In particular, four constituents in Applicants' filler metal interact to provide improved properties in the weld joint, particularly with respect to corrosion and shrinkage, which tends to physically distort the weld joint.

With respect to carbon, Applicants' filler metal allows for a higher carbon content compatible with the adjacent steel. Lower carbon content would undesirably dilute the adjacent steel and thus affect the properties of the steel around the weld. Also, carbon is

critical to forming the martensite phase in the product weld that reduces shrinkage. However, the higher carbon content also tends to form chromium carbide, which reduces the effective chromium content for corrosion protection.

The chromium content of Applicants' filler metal is adjusted to be compatible with the stainless steel, as opposed to the mild steel. This prevents dilution of the adjacent stainless steel and enhances corrosion protection both in the weld and the adjacent stainless steel. However, the interaction of chromium and carbon forms chromium carbide that reduces corrosion protection.

Applicants' filler metal includes nickel in an amount effective, in combination with the carbon, to form a high martensite phase in the product weld. The transition of austenite to martensite during welding in accompanied by expansion, which counteracts the effect of thermal shrinkage and reduces warpage of the weld joint.

Applicants' filler metal also contains titanium in an amount effective to inhibit formation of chromium carbides that would otherwise reduce corrosion protection. Despite the high titanium content, sufficient carbon is available to form the high martensite content that reduces shrinkage. Moreover, the high titanium content does not interfere with the effect of nickel in enhancing the formation of the martensite to mitigate shrinkage.

JP '456 describes steel that forms a structural component. The Abstract is silent as to the filler, if any, used in the welding the structural steel. The rejection points to alloy 4

in Table 1. However, alloy 4 does not contain Ti and so is readily distinguished from Applicants' filler. Table 4 includes some Ti alloys, but only in combination with carbon (0.047% or less) and nickel (0.024% or less) that is significantly lower than Applicants' filler. Moreover, JP '456 points to a Ti content less than 0.35%, substantially lower than 1.0 to 1.5% Ti in Applicants' filler. Thus, nothing in JP '456 points the practitioner to triple the Ti content, as well as increase the carbon and the nickel, in order to provide a filler, particularly if used for welding the steel described in JP '456.

JP '554 also describes steel for a structural component, as opposed to a filler metal for a weld. The steel contains not more than 0.03% C and 0.3% Ti. The rejection points to alloy D in Table 1. Alloy D contains 0.005% C and 0.15% Ti, both substantially less than in Applicants' filler metal. The practitioner would not be led to substantially increase the carbon content in the filler greater than the base steel. Moreover, nothing in JP '554 points the practitioner to triple the Ti content, particularly in view of the low carbon. Thus, the structural steel in JP '554 does not suggest Applicants' filler composition.

JP '182 describes a filler metal for welding. However, the filler metal contains at most 0.015% C. The rejection points to alloy A12 in Table 1. However, alloy A12 contains 0.01% C and 0.15% Ti, both substantially less than Applicants' composition. As with the other references, there is nothing in JP '182 to point the practitioner to increase the carbon content, to triple the Ti content to mitigate the effect on the chromium, and so arrive at Applicants' filler composition.

The rejection recognizes that the references only show steels having a lower Ti addition, but contends that the increased Ti content is not a patentable distinction. However, the teachings of the references are to provide a low carbon steel, whether for the structural component in JP '456 and JP '554 or filler metal in JP '182. Applicants provide a filler having a higher carbon content that is particularly suited for use with the commercial steels having higher carbon than described in the references, and mitigates the effect on corrosion protection by the increased Ti addition. Because of the low carbon content, the references lack motivation to increase the Ti and so fail to make a prima facie case of obviousness to triple the Ti content so as to arrive at Applicants' invention.

Claim 8 is directed to Applicants' method that is characterized by the composition of the filler metal used for welding the components. The recited carbon in the filler is 0.05 to 0.1%. The references relate to steel having less than 0.05% C. The claim calls for Ti of 1.0 to 1.5%, more than three times the amount in the references. Because they relate to lower carbon steel, the references provides no reason to triple the Ti. Thus, the Japanese references do not lead the practitioner to Applicants' invention in claim 8.

Claims 9-10 and 14-23 are dependent upon claim 8, and so not suggested by the Japanese references at least for the reasons set forth with regard to that claim, and recite additional features preferred in the practice of Applicants' invention. In particular, Claims 9-10 and 21-22 recite preferred martensite proportions obtained by Applicants' welding method. The effect on martensite formation produced by a tripling of the Ti

addition is not known from the references, particularly in view of the low carbon content in the steels of the references. Also, claims 13 is directed to a preferred filler compositions that includes 0.05 to 0.07% carbon, more than the carbon in the steels described in the Japanese references.

Claim 24 is directed to Applicants' welded stainless steel article that includes a weld joint formed by stainless steel weld material having a composition similar to the filler material recited in claim 1, including C and Ti content. For the reasons above, the references do not teach or suggest Applicants' article in claim 24 or dependent claim 25

Accordingly, it is respectfully requested that the rejection of the claims based upon the Abstracts of the Japanese patent documents be reconsidered and withdrawn, and that the claims be allowed.

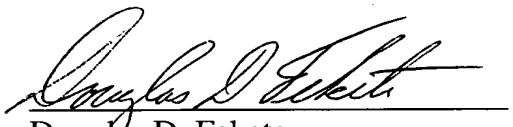
Conclusion

Claim 27 was indicated to be allowable subject matter, but was objected to as dependent upon a rejected base claim. In view of the amendments and remarks herein, it is believed that the base claim is now allowable. Accordingly, it is requested that the objection be withdrawn, and that all claims be allowed.

If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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